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ABSTRACT

In order to examine the academic performance of graduates from Crowder College (Neosho, Missouri) who had transferred to Southwest Missouri State University (SMSU), the grade point averages of three different groups of SMSU students were compared: (1) Crowder College transfers; (2) their undergraduate contemporaries at SMSU; (3) the entire group of Missouri community college transfer students enrolled at SMSU. In addition, direct comparisons were made between the cumulative grade point averages students had earned at Crowder, and the cumulative grade point averages they earned at SMSU. There was no significant difference between the Crowder graduates and the graduates from other Missouri community colleges in terms of distributions among the five grade point average categories at SMSU. There was no significant difference in 10 out of 12 college class-sex subgroups when Crowder graduates were compared with all SMSU undergraduate students. There was no significant difference observed for any group in comparing the cumulative Crowder College grade point average with the SMSU cumulative grade point average. Data are organized into tables, and a detailed description of the various statistical tests applied to the data is provided. (Author/NHM)

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AN ANALYSIS OF THE ACADEMIC PERFORMANCE OF CROWDER COLLEGE TRANSFER STUDENTS AT SOUTHWEST MISSOURI STATE UNIVERSITY

Crowder College
Neosho, Missouri 64850

Institutional Research Report 2-74

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2

December, 1974

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ABSTRACT

The academic performance of graduates from Crowder College in Neosho, Missouri who had transferred to Southwest Missouri State University (SMSU) in Springfield was examined. The performance was statistically tested by comparing grade point averages of different groups of students. Comparisons for a single semester were made between the Crowder College students and (1) their undergraduate contemporaries at SMSU and (2) between all Missouri community college transfer students enrolled at the university. Comparing the Crowder and SMSU performances directly, comparisons were made between the cumulative grade point averages earned at Crowder and the cumulative grade point averages earned at SMSU.

There was no significant difference between the Crowder graduates and the graduates from other Missouri community colleges in terms of distributions among five grade point average categories at the university. There was no significant difference in ten out of twelve college class-sex subgroups when Crowder graduates were compared with all SMSU undergraduate students. There was no significant difference observed for any group when the cumulative Crowder College grade point average was compared with the cumulative grade point average earned at SMSU. No evidence of transfer shock was seen in the group of recently transferred students.

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I. Introduction

One of the important functions of the comprehensive community college is to provide education in various transfer programs. These programs require more than two years of education. Upon completion of given curricula at a community college, students are expected to pursue advanced study at four-year colleges or universities. The transfer students should be able to continue their work at the advanced institution without being penalized for having attended a community college.

Transfer penalties can take two forms: 1) the student might have to repeat courses already taken at the community college; 2) the academic performance of the student might drop at the new institution. The first mentioned penalty can be and is minimized through close cooperation between the professional staffs of the various collegiate institutions. This cooperation insures that, within the confines of academic freedom, similar courses at different institutions cover basically the same material. A second means of cooperation is evidenced with the recent articulation agreement between and among all institutions of higher education within the state of Missouri.

The other possible penalty mentioned above is not easily minimized. Measurement of academic performance is generally based upon the student's grade point average (GPA). Despite the profusion of grading techniques employed by college teachers, it should be possible to compare a student's performance at various institutions in a meaningful way. A good student should do well at any college or university, while average students should do average work. This performance should be reflected in the GPA accrued at each school, in that one would not expect a large difference in this value from

different schools.

The purpose of this report is to examine the academic performance of former Crowder College students who have transferred to Southwest Missouri State University (SMSU) at Springfield, Missouri. The academic performance was examined by comparing grade point averages of different groups of students. Comparisons were made between the Crowder College students and their undergraduate contemporaries at SMSU and also between all Missouri junior college transfer students enrolled at SMSU. In addition, a comparison was made between the student's GPA at Crowder College and his GPA at SMSU.

II. The Statistical Procedure

A. The Data

Data for this study were supplied in part by the Office of Admissions and Records at SMSU.[1] The data consisted of a computer print-out showing the performance of all students from Crowder College who were enrolled at SMSU during the spring semester of 1974. Included in this information were the items: (1) the total number of college hours earned, (2) the number of college hours passed at SMSU, (3) the fall semester, 1973 grade point average at SMSU, and (4) the cumulative grade point average for all semesters at SMSU. The permanent records at Crowder College were examined to supplement the information provided by SMSU. The data obtained from the permanent records included: (1) the total number of hours earned at Crowder College and (2) the cumulative grade point average for all semesters at Crowder College.

Also included with this GPA information were data dealing with all community college transfers at the university. These data included the numbers and percentages of these students in five cumulative grade point average categories.

Subsequent correspondence[2] with the officials at SMSU provided more data, including the mean cumulative grade point averages for all SMSU undergraduate students as of the end of the fall semester, 1973. These data were subdivided into college class and sex in order to provide more extensive comparisons.

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[1] Edward Pierce, "Articulation Items," Private Communication, April 4, 1974.

[2] Edward Pierce, "SMSU Undergraduate Grade Point Averages," Private Communication, June 27, 1974.

B. The Statistical Tests

Four statistical tests were performed with the data described. Comparisons were made between the former Crowder College students and all Missouri community college transfers at SMSU. A comparison was also made between the Crowder College transfer students and the total undergraduate pool at SMSU. Crowder College transfers were included in the total undergraduate pool. These tests would show if there were a statistical difference in academic performance between students who had originated from different collegiate backgrounds. The last two tests compared the academic performance of the Crowder College transfer students at Crowder College with their performance at SMSU. The purpose of these tests was to determine whether or not a statistical difference existed between the grades earned at the two institutions. All statistical tests were run at a significance level of 10% (α=0.1) or a confidence level of 90%.

The first test involved a comparison of all Missouri community college transfer students. The populations and percentages of these students were given in terms of five grade point average categories. The GPA categories were cumulative to the end of the fall semester, 1973. These averages reflect credit earned at SMSU only. The number of Crowder College transfer students in each GPA category was also obtained. Forty-eight of 54 former Crowder College students (89%) had earned at least one semester of credit at SMSU. This compares with 662 out of a total community college transfer pool of 760 students (87%). It should be noted that the total community college data includes the Crowder College transfers.

The statistical comparison dealt with the number of Crowder College transfer students in the same GPA categories. Since a comparison was being made

between the frequency of occurrences in different cells, the chi-square statistical test was employed.

A comparison between the transfer students from Crowder College and the total undergraduate population at SMSU formed the basis of the second statistical test. Several mean cumulative grade point averages were available for the SMSU students. Again, these GPA's were cumulative to the end of the fall semester, 1973. The GPA's were provided in terms of (1) college class, (2) sex, and (3) college class-sex subgroups. The transfer students from Crowder College who had completed a minimum of one semester of work at SMSU were divided into the same groups.

A statistical comparison was made between the average of the SMSU cumulative GPA's for the previous Crowder College students and their contemporaries at SMSU. The single numerical statistic for the SMSU students in each classification was compared to the group of students from Crowder College. Therefore, the standard error of the mean test was used.

The last two comparisons dealt with in this report were concerned only with the former Crowder College students. These tests examined their academic performance at Crowder College and at SMSU. In both tests, the students were divided into groups composed of (1) college class, (2) sex, and (3) college class-sex subgroups. The two tests dealt with the cumulative GPA earned at Crowder College in comparison with the cumulative and the fall semester, 1973, grade point averages earned at SMSU. All 5[illegible] students were used in calculating the Crowder College statistics while only the 48 students who had completed a minimum of one semester at SMSU were used for the SMSU statistics.

There were actually two statistical comparisons made with each of these tests. The average GPA for each group from the two institutions was compared. In addition, the GPA variances were compared for each group. The variance

was studied in order to obtain a measure of the fluctuation about the average GPA value for each group. Since the mean GPA for several students in each group was compared between the two institutions, the T-test was used. In a similar manner, the GPA variance for several students in each group was compared between the two institutions. Therefore, the F-test was used. In all instances, two tailed tests were used.

The statements of null hypothesis for the statistical comparisons are listed below.

1. There was no significant difference between the number of Crowder College transfer students in each cumulative grade point average category and the number of Missouri community college transfer students in the same categories.
2. There was no significant difference between the mean cumulative grade point average of Crowder College transfer students in various college class and sex classifications and the value of the mean cumulative grade point average of the SMSU undergraduate students in the same classifications.
3. There was no significant difference between the mean cumulative grade point average of students in various college class and sex classifications at Crowder College and at SMSU.
4. There was no significant difference between the cumulative grade point average variance of students in various college class and sex classifications while they attended Crowder College or after they transferred to SMSU.
5. There was no significant difference between the mean Crowder College cumulative grade point average of students in various college class and sex classifications and the average SMSU fall semester, 1973, grade point average for the same students.

6. There was no significant difference between the Crowder College cumulative grade point average variance of students in various college class and sex classifications and the SMSU fall semester, 1973, grade point average for the same students.

Before the analysis of the statistical results is begun, a further explanation of the confidence level should be made. According to established statistical procedure, it is necessary to establish confidence levels prior to running the test. This procedure helps to prevent bias on the part of the individual running the test. Because of the low populations involved in some of the tests, it was decided to set rather high confidence levels. A cursory examination of the results in the various tests would seem to show differences between the groups. However, for this study, the combination of low population and large data scatter have combined to produce some of the statistical conclusions shown. As future longitudinal studies are made on this subject, there will be sufficient data available in order to make more meaningful comparisons with national transfer norms.

III. Analysis

Table I shows the number of Crowder College and Missouri community college transfer students in five cumulative GPA categories. Also shown in the table are the number of students from each group who had not earned any SMSU credit as of the fall semester of 1973. These students had just enrolled at the university during that semester. The percentages in the table and statistical comparisons that were performed dealt only with those students who had earned credit at SMSU.

As can be seen in the table, there did not appear to be a large percentage difference between the two groups in the five GPA categories. In no case was

Table I: Cumulative Grade Point Average Distributions of Community College Transfer Students at Southwest Missouri State University. Fall Semester, 1973.

GPA Category	Crowder College N	Crowder College %	All Community Colleges N	All Community Colleges %
Less than 2.00	12	25	171	26
2.00 - 2.50	15	31	225	34
2.51 - 3.00	9	19	162	24
3.01 - 3.50	8	17	78	12
3.51 - 4.00	4	8	26	4
	48	100	662	100
No Credit	6		98	
	54		760	

χ^2 (calculated) = 3.6544
df = 4

χ^2 (α = 0.1) = 7.7794

there more than a 5% difference between the two community college groups. The statistical comparisons are shown in the data below the table. The calculated chi-square value was 3.6544, while the table value for four degrees of freedom was 7.7794. Between the two college groups studied in this test, there was no significant difference in the number of students in the five GPA categories. Therefore, the null hypothesis for this test was accepted. The implication seemed to be that Crowder College students were doing comparable work with the other community college transfers from the state of Missouri.

The comparisons between the Crowder College transfers' cumulative GPA and the cumulative GPA for all SMSU undergraduate students are shown in Table II. The N column shows the number of former Crowder College students in each class-sex group. The next two columns provide the average cumulative GPA with the standard deviation for each group. The column under the heading Test Value represents the average cumulative GPA's for all SMSU undergraduate students. No other statistical information was available for these students. The final column shows whether or not a significant difference exists between the average Crowder College transfer GPA and the average GPA for all undergraduate students.

Since there was only one freshman transfer from Crowder College, there was insufficient data for the test, so no statistical comparison was made. As can be seen from the table, only two groups exhibited a significant difference. These groups had a cumulative GPA lower than the SMSU students to which they were compared. Therefore, the null hypothesis was rejected for these groups. There was a significant difference between the mean cumulative grade point averages for the sophomore females and the senior males from Crowder College and the value of the cumulative grade point average for the corresponding groups from SMSU. There was no significant difference found for any other group. Therefore, the null hypothesis was accepted for these groups. This result

Table II: Cumulative Grade Point Average Comparisons Crowder College Transfer Students and All Southwest Missouri State University Undergraduate Students. Fall Semester, 1973

Group	N	Mean	Standard Deviation	Test Value	Significant Difference ($\alpha = 0.1$)
Freshman Males	1	3.56	-	2.01	-
Freshman Females	0	-	-	2.36	-
Freshmen	1	3.56	-	2.19	-
Sophomore Males	3	2.36	1.07	2.35	No
Sophomore Females	4	2.25	.36	2.59	Yes
Sophomores	7	2.30	.67	2.47	No
Junior Males	14	2.42	.80	2.45	No
Junior Females	5	2.45	1.03	2.74	No
Juniors	19	2.43	.84	2.58	No
Senior Males	14	2.28	.38	2.54	Yes
Senior Females	7	2.95	.40	2.83	No
Seniors	21	2.50	.50	2.67	No
Males	32	2.39	.68	2.45	No
Females	16	2.62	.69	2.72	No
Total	48	2.47	.68	2.57	No

implies that these groups from Crowder College were doing comparable work with their SMSU contemporaries.

As stated before, the remaining four tests compared the performance of the transfer students while at Crowder College and while at SMSU. The first two tests examined the cumulative GPA and GPA variance. The results of these tests are shown in Table III. The students were again divided into college class-sex groups. The first two columns in this table show the populations in each group enrolled at the two schools. The lower numbers at SMSU reflected the fact that six students had not earned any credit as of the end of the fall semester, 1973. The next three columns show the average cumulative GPA earned at both schools and indicates whether or not a significant difference existed. The final three columns in the table provide the GPA variance at both institutions and indicate whether or not a significant difference existed between these statistical quantities.

The first test to be analyzed deals with the comparison between the mean cumulative GPA's. As is seen from the table, there was no significant difference between any group. Therefore, the null hypothesis for this test was accepted for all groups. This would seem to agree with published studies which have shown that on a long term basis, junior college transfers maintain a similar grade point average at their transfer institution.

The second test dealt with the comparison of GPA variances. This statistical parameter was included to supplement the results in the preceding test. Table III shows that there were only two groups which had a significant difference in their GPA variances. The sophomore females had a significantly greater scatter in their mean GPA at Crowder College than they did at SMSU. Reversing this result, the juniors had a significantly greater scatter in their mean GPA at SMSU than at Crowder College. Therefore, the null hypothesis was rejected for these two groups. There was no significant difference between any

Table III: Comparison of Crowder College and Southwest Missouri State University Cumulative Grade Point Average

Group	Population		Average GPA		Significant Difference ($\alpha = 0.1$)	GPA Variance		Significant Difference ($\alpha = 0.1$)
	CC	SMSU	CC	SMSU		CC	SMSU	
Freshman Males	2	1	1.93	3.56	No	1.48	-	-
Freshman Females	0	0	-	-	-	-	-	-
Freshmen	2	1	1.93	3.56	No	1.48	-	-
Sophomore Males	3	3	2.31	2.36	No	.39	1.15	No
Sophomore Females	4	4	2.83	2.25	No	.97	.13	Yes
Sophomores	7	7	2.61	2.30	No	.69	.45	No
Junior Males	17	14	2.57	2.42	No	.33	.65	No
Junior Females	7	5	2.93	2.45	No	.38	1.06	No
Juniors	24	19	2.67	2.43	No	.36	.70	Yes
Senior Males	14	14	2.54	2.28	No	.21	.15	No
Senior Females	7	7	3.09	2.95	No	.41	.16	No
Seniors	21	21	2.73	2.51	No	.32	.25	No
Males	36	32	2.50	2.39	No	.32	.46	No
Females	18	16	2.97	2.62	No	.46	.47	No
Total	54	48	2.66	2.47	No	.41	.46	No

other groups; thus, the null hypothesis was accepted for these groups.

The final tests in this group compared the Crowder College cumulative GPA and GPA variance with the Fall, 1973, GPA and GPA variance at SMSU. The results are summarized in Table IV. The first three columns show the groups being compared and the population in each group at both schools. The next three columns show respectively, the cumulative Crowder College GPA, the Fall, 1973, GPA at SMSU, and whether or not a significant difference existed. The final columns show the GPA variance at Crowder College and at SMSU and the statement of whether or not a significant difference existed.

The population being studied was divided into college class-sex subgroups as before. However, there were two additional groups which were studied. These groups dealt with those students who had earned more than 20 hours at SMSU and those students who had earned less than 20 hours at the university. In this way, it was possible to test for the presence of any evidence of transfer shock in the newly transferred students.

As in seen in Table IV, there was no significant difference between the cumulative Crowder College GPA and the Fall, 1973, GPA at SMSU for any group. Therefore, the null hypothesis was accepted for all groups in this test. Also shown in the table is the fact that there was no significant difference in the GPA variance for any group. The null hypothesis was also accepted for all groups in this test.

These results would seem to support the results shown in the earlier cumulative GPA comparisons. For a particular semester, the academic performance of the various groups was not significantly different from the cumulative academic performance at Crowder College. Special attention should be given to the less than 20 hour group. There is no evidence of "transfer shock" in this group. Earlier nation-wide studies of junior college transfers have

Table IV: Comparison of Crowder College Cumulative Grade Point Average with Southwest Missouri State University Fall, 1973 Grade Point Average

Group	Population		Average GPA		Significant Difference ($\alpha = 0.1$)	GPA Variance		Significant Difference ($\alpha = 0.1$)
	CC	SMSU	CC	SMSU		CC	SMSU	
Freshman Males	2	1	1.93	4.00	No	1.48	-	-
Freshman Females	0	0	-	-	-	-	-	-
Freshmen	2	1	1.93	4.00	No	1.48	-	-
Sophomore Males	3	3	2.31	2.58	No	.39	1.07	No
Sophomore Females	4	3	2.83	2.66	No	.97	.42	No
Sophomores	7	6	2.61	2.62	No	.69	.60	No
Junior Males	17	10	2.57	2.73	No	.33	.31	No
Junior Females	7	4	2.93	2.65	No	.38	.70	No
Juniors	24	14	2.68	2.71	No	.34	.38	No
Senior Males	14	13	2.55	2.35	No	.21	.22	No
Senior Females	7	6	3.09	3.14	No	.41	.27	No
Seniors	21	19	2.70	2.71	No	.32	.38	No
Males	36	27	2.54	2.66	No	.37	.42	No
Females	18	13	2.97	2.87	No	.46	.42	No
Total	54	40	2.66	2.73	No	.41	.42	No
Less than 20 hrs.	12	12	2.98	2.53	No	.32	.57	No
Greater than 20 hrs	42	28	2.57	2.81	No	.40	.35	No

shown a decrease in GPA immediately after transfer and then restitution to the earlier GPA level at a later time. There was no statistically significant change in the GPA of the newly transferred students examined in this report.

IV. Conclusion

This report has shown that the students who transferred to SMSU from Crowder College fared quite well. There was no significant difference between the Crowder graduates and the graduates from other Missouri community colleges in terms of distributions among five GPA categories at the university. Also, there was no significant difference in ten out of twelve groups when the Crowder graduates were compared to all SMSU undergraduate students. Only the sophomore females and the senior males ranked lower than their SMSU contemporaries. Cumulative grade point averages were compared in both tests. These results can be interpreted as showing that the Crowder College graduates seemed to compare favorably with other undergraduates at SMSU. This comparison included all community college transfers as well as those students who originated at SMSU.

The final tests examined the grade point averages of Crowder graduates before and after they transferred to SMSU. There were no significant differences between the cumulative Crowder College GPA and either the SMSU cumulative grade point average or the SMSU fall, 1973, grade point average. No evidence of transfer shock was seen in the newly transferred students. As a group, these students were able to maintain their grade point average at the Crowder College level. For the most part, the transfer students did not exhibit a significant difference in their GPA variance. Only two groups showed a significantly greater scatter in their grade point averages. The sophomore females exhibited a greater scattering at Crowder College, while the total junior group had more fluctuation at SMSU. Both of these differences occurred with the cumulative GPA data.

Similar studies should be made in the future. It would be useful to extend this type of study to other schools to which Crowder students transfer.

A study of Missouri Southern State College transfers could be especially beneficial since the majority of Crowder's transfers are to this institution. In addition, more studies should be made on SMSU transfers. As a greater data base is built up among these students, it will be interesting to see whether the absence of transfer shock is still exhibited in opposition to national trends. In any event, it is incumbent on an institution to keep track of its students in order to better judge the worth of its programs.

V. Acknowledgements

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